DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 10 & 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sandstrom (U.S. Patent Publication # 6697373)**, and in view of **Fuhrmann et al. (U.S. Patent #5745837).**

Consider **claims 1 and 10,** Sandstrom clearly discloses and shows a method of adaptively managing bandwidth (abstract) among a plurality of services contending for bandwidth on an optical link having a bandwidth capacity (col. 14, lines 53-61(available capacity)), the method comprising:

allocating bandwidth to each service (col. 14, lines bandwidth is dynamically allocated) contending for bandwidth (col. 14, lines 53-61(available capacity)) of the optical link (abstract (SONET));

allocating additional bandwidth (column 2, lines 59-65; column 9, lines 48-55(if link is not at full capacity, bandwidth will be diverted from other segments to the one that needs it)) to one of the services in response to the current utilization metric of that service if bandwidth usage of the optical link is currently at less than full capacity, otherwise balancing the bandwidth allocation (column 2, lines 59-65; column 9, lines 48-55 (if the link is at full capacity, balance the bandwidth usage according to current utilization metric)) between the services in response to the current utilization metric of at

least one of the services if the bandwidth usage of the optical link is currently at full capacity.

However, Sandstrom does not disclose computing metric of a usage of maximum allowed bandwidth, and the metric of current usage of the allowed bandwidth, so that the two metrics are made approximately equal to each other.

In the same field of endeavor, Fuhrmann et al. clearly show:

computing for each service a utilization metric representing a measure of current usage of a maximum allowed bandwidth for that service (fig. 44, col. 45, lines 39-57 (aggregated peak rate allocation may exceed the maximum bandwidth possible)).

computing for each service a current utilization metric (fig. 43 (1102 measure of CPE usage)) representing a measure of current usage of the allocated bandwidth by that service (fig. 46 (#2 current CPE usage), col. 45, lines 58-col.46 line 30); and

such that the utilization metrics of the services are made approximately equal to each other (fig. 45 B&C, col. 45, lines 58-col.46 line 30 (bandwidth can be deallocated if it is underused, and added if more is needed and extra bandwidth is available)).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a bandwidth managing method, as taught by Sandstrom et al., and assign bandwidth according to usage capacity, as taught by Furhmann, in order to guarantee that the SONET network is utilizing its bandwidth efficiently.

Consider **claim 15,** and **as applied to claim 10 above,** Sandstrom, as modified by Rose, clearly disclose and show a full utilization metric (column 11, lines 13-19 (cap (transmission capacity)) with each service to determine a maximum bandwidth allocation (column 8, lines 28-50 (target capacity)) for each service and a priority between the services to be used when balancing (column 9, lines 48-55).

Claims 6, 8 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sandstrom (U.S. Patent Publication # 6697373)**, in view of **Fuhrmann et al. (U.S. Patent #5745837)**, and in view of **Aimoto (U.S. Patent # 6144636)**.

Consider **claim 6,** and **as applied to claim 1 above,** Sanstrom clearly disclose and show the method as described.

However, Sanstrom does not specifically disclose that a bandwidth allocated can be a granularity of the STS-1 plan.

In the same field of endeavor, Almoto et al. clearly show the additional bandwidth allocated to one of the services is a granularity of an STS-1 path (fig. 4, column 3, lines 56-67, column 4, lines 1-3 (the gigabit Ethernet communication adapter can adapt to a lower speed)).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a bandwidth managing method, as taught

by Bruckman et al., and assign bandwidth according to usage capacity, as taught by Aimoto et al., in order to guarantee that the SONET network is utilizing its bandwidth efficiently.

Consider **claim 8,** and **as applied to claim 1 above,** Sanstrom clearly discloses and shows a full utilization metric (column 11, lines 13-19 (cap (transmission capacity)) with each service to determine a maximum bandwidth allocation (column 8, lines 28-50 (target capacity)) for each service when balancing (column 9, lines 48-55).

However, Sanstrom does not specifically show the priority associated with the service.

In the same field of endeavor, Aimoto et al., clearly show a priority (column 1, lines 19-35) between the services to be used when balancing.

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a bandwidth managing method, as taught by Bruckman et al., and assign bandwidth according to usage capacity, as taught by Sandstrom, and assign priority for each service, as taught by Aimoto et al., in order to guarantee that the SONET network is utilizing its bandwidth efficiently.

Consider **claim 13,** and **as applied to claim 10 above,** Sanstrom clearly discloses and shows a step of balancing includes removing bandwidth from one of the

services and allocating the removed bandwidth to another one of the services (column 2, lines 59-65; column 9, lines 48-55).

Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Bruckman et al. (U.S. Patent Publication # 20040179519)**, in view of **Sandstrom (U.S. Patent # 6697373)**, and in view of **Fuhrmann et al. (U.S. Patent #5745837)**.

Consider **claim 16,** Bruckman et al. clearly disclose and show a network, comprising:

a plurality of network elements (fig. 1 (32s (data nodes))) connected to each other by optical links (fig. 1;paragraph 52 (SONET));

a first path for carrying traffic associated with a first service through the network, the first path extending through the network over at least one of the optical links (fig. 1;paragraph 52);

a second path for carrying traffic associated with a second service, the second path extending through the network over at least one of the optical links, the second path having a link in common with the first path (fig. 1;paragraph 52);

wherein a first one of the network elements allocates a portion of the bandwidth (paragraph 5 (LCAS for bandwidth allocation)) of the common link to the first service and a second one of the network elements allocates a portion of the bandwidth (paragraph 5 (LCAS for bandwidth allocation)) of the common link to the second service.

However, Bruckman et al. do not specifically show bandwidth assignment corresponding to usage capacity.

In the same field of endeavor, Sandstrom clearly shows each of the first and second network elements determining for the first and second services, respectively, a current utilization metric (column 5, lines 63-67, column 6, lines 1-7) representing a current usage by that service of the bandwidth allocated to that service, the first and second network elements balancing the bandwidth allocated to the services (column 2, lines 59-65; column 9, lines 48-55 (if the link is at full capacity, balance the bandwidth usage according to current utilization metric)) if the current utilization metric of at least one of the services exceeds a specified threshold and usage of the bandwidth of the common link is currently at full capacity.

computing for each service a utilization metric representing a measure of current usage of a maximum allowed bandwidth for that service (paragraph 0006, lines 4-7 (computes the traffic flow)), such that the utilization metrics of the services are made approximately equal to each other (paragraph 0006, lines 8-15 (fair sharing)).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a bandwidth managing method, as taught by Bruckman et al., and assign bandwidth according to usage capacity, as taught by Sandstrom, so that bandwidth is shared among services.

However, Bruckman, as modified by Sandstrom, do not disclose computing metric of a usage of maximum allowed bandwidth, and the metric of current usage of

the allowed bandwidth, so that the two metrics are made approximately equal to each other.

In the same field of endeavor, Fuhrmann et al. clearly show:

computing for each service a utilization metric representing a measure of current usage of a maximum allowed bandwidth for that service (fig. 44, col. 45, lines 39-57 (aggregated peak rate allocation may exceed the maximum bandwidth possible)).

computing for each service a current utilization metric (fig. 43 (1102 measure of CPE usage)) representing a measure of current usage of the allocated bandwidth by that service (fig. 46 (#2 current CPE usage), col. 45, lines 58-col.46 line 30); and

such that the utilization metrics of the services are made approximately equal to each other (fig. 45 B&C, col. 45, lines 58-col.46 line 30 (bandwidth can be borrowed if it is underused, and added if it needs more and extra bandwidth is available)).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a bandwidth managing method, as taught by Bruckman et al., and assign bandwidth according to usage capacity, as taught by Sandstrom,, and assign bandwidth according to usage capacity, as taught by Furhmann, in order to guarantee that the SONET network is utilizing its bandwidth efficiently.

Consider **claim 17,** and **as applied to claim 16 above,** Bruckman et al. clearly disclose and show a network, further comprising a central controller (paragraph 8

(manager node)) for sending messages to the network elements (paragraph 8) that direct the balancing of the bandwidth allocated to the services.

Consider **claim 18,** and **as applied to claim 16 above,** Bruckman et al. clearly disclose and show a network, wherein the network is a ring network (paragraph 8 (ring network)).

Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sandstrom (U.S. Patent # 6697373),** in view of **Fuhrmann et al. (U.S. Patent #5745837)**, and further in view of **Branstad et al. (U.S. Patent # 6498782).**

Consider **claim 2,** and **as applied to claim 1 above,** Sandstrom clearly discloses and shows the method as described.

However, Sandstrom does not specifically disclose a gigabit Ethernet service.

In the same field of endeavor, Branstad et al. clearly show a Gigabit Ethernet communication adapter (fig. 4, column 3, lines 52-56).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a bandwidth managing method, as taught by Sandstrom, and assign bandwidth according to usage capacity, as taught by Branstad et al., in order to guarantee that the SONET network is utilizing its bandwidth efficiently.

Consider **claim 4,** and **as applied to claim 1 above,** Sandstrom clearly disclose and show the method as described.

However, Sandstrom do not specifically disclose a rate setting mechanism.

In the same field of endeavor, Branstad et al. clearly show an adjustment limit parameter (fig. 4 (412), fig. 5;column 4, lines 46-57) with each service to control when to increase the bandwidth allocated to that service.

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a bandwidth managing method, as taught by Sandstrom, and assign bandwidth according to usage capacity, as taught by Branstad et al., in order to guarantee that the SONET network is utilizing its bandwidth efficiently.

Claims 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sandstrom (U.S. Patent # 6697373)**, in view of **Fuhrmann et al. (U.S. Patent #5745837), and Branstad et al. (U.S. Patent # 6498782)**, and in view of **Aimoto (U.S. Patent # 6144636)**.

Consider **claim 5,** and **as applied to claim 4 above,** Sandstrom clearly disclose and show the method as described.

However, Sandstrom do not specifically disclose a threshold value for current utilization metric.

In the same field of endeavor, Aimoto et al. clearly show that additional bandwidth is allocated to one of the services if the current utilization metric exceeds a threshold (column 6, lines 41-45 & 52-65) based on the adjustment limit parameter for that service.

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a bandwidth managing method, as taught by Sandstrom, and adjust the bandwidth according to the threshold, as taught by Almoto, in order to guarantee that the SONET network is utilizing its bandwidth efficiently.

Consider **claim 9,** and **as applied to claim 1 above,** Sandstrom clearly disclose and show the method as described.

However, Sandstrom do not specifically show the service-of-interest.

In the same field of endeavor, Branstad et al. clearly show for each service, a services-of-interest list (fig. 2, column 4, lines 25-39 (the link is shared by other services, e.g. 1M , 10M, 100M and 1G speed Ethernet)) for identifying one or more services with which that service contends for the bandwidth of the optical link.

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a bandwidth managing method, as taught

by Sandstrom, and identify a list of services, as taught by Branstad et al., in order to guarantee that the SONET network is utilizing its bandwidth efficiently.

Claims 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Sandstrom (U.S. Patent # 6697373)**, in view of **Fuhrmann et al. (U.S. Patent #5745837),** and **Aimoto (U.S. Patent # 6144636)**, and in view of **Branstad et al. (U.S. Patent # 6498782)**.

Consider **claim 14,** and **as applied to claim 10 above,** Sandstrom clearly disclose and show the method as described.

However, Sandstrom do not specifically disclose a threshold value for current utilization metric.

In the same field of endeavor, Aimoto et al. clearly show that additional bandwidth is allocated to one of the services if the current utilization metric exceeds a threshold (column 6, lines 41-45 & 52-65) based on the adjustment limit parameter for that service and usage of the bandwidth of the optical link is currently less than full capacity.

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a bandwidth managing method, as taught by Bruckman et al., and assign bandwidth according to usage capacity, as taught by Aimoto et al., in order to guarantee that the SONET network is utilizing its bandwidth efficiently.

However, Sandstrom, as modified by Aimoto, do not specifically disclose a rate setting mechanism.

In the same field of endeavor, Branstad et al. clearly show an adjustment limit parameter (fig. 4 (412), fig. 5;column 4, lines 46-57) with each service.

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a bandwidth managing method, as taught bySandstrom, assign bandwidth according to usage capacity, as taught by Aimoto, and show an adjustment limit parameter with each service, as taught by Branstad et al., in order to balance the bandwidth usage.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Sandstrom (U.S. Patent # 6697373)**, and in view of **Fuhrmann et al. (U.S. Patent #5745837)**, and in view **of Bruckman et al. (U.S. Patent Publication # 20040179519)**.

Consider **claim 7,** and **as applied to claim 1 above,** Sandstrom clearly disclose the method as described.

However, Sandstrom does not disclose LCAS technology. In the same field of endeavor, Bruckman clearly show using Link Capacity Adjustment Schemes (LCAS) technology (paragraph 5) to allocate additional bandwidth to one of the services when usage of the optical link is at less than full capacity.

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a bandwidth managing method, as taught by Sandstrom et al., and show the LCAS technology, as taught by Bruckman, in order to guarantee that the SONET network is utilizing its bandwidth efficiently.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Bruckman et al. (U.S. Patent Publication # 20040179518),** in view of **Sandstrom (U.S. Patent # 6697373)** and **Fuhrmann et al. (U.S. Patent #5745837),** and further in view of **Montgomery, JR. (U.S. Patent Publication # 20040057453).**

Consider **claim 19,** and **as applied to claim 16 above,** Bruckman et al., as modified by Sandstrom, clearly disclose and show the method as described.

However, Bruckman et al., as modified by Sandstrom, do not specifically disclose a linear network for the optical Sonet network.

In the same field of endeavor, Montgomery, JR. clearly show a network, wherein the network is a linear network (fig. 10, paragraph 57).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a bandwidth managing method, as taught by Bruckman et al., and demonstrate that the optical ring network can also be a linear network, as taught by Montgomery, JR., in order to guarantee that the SONET network is utilizing its bandwidth efficiently.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Bruckman et al. (U.S. Patent Publication # 20040179518),** in view of **Sandstrom (U.S. Patent # 6697373)** and **Fuhrmann et al. (U.S. Patent #5745837)**, and further in view of **Branstad et al. (U.S. Patent # 6498782)**.

Consider **claim 20,** and **as applied to claim 16 above,** Bruckman et al. clearly disclose and show the method as described.

However, Bruckman et al. do not specifically show the service-of-interest.

In the same field of endeavor, Branstad et al. clearly show first and second network elements each maintain a services-of-interest list (fig. 2, column 4, lines 25-39 (the link is shared by other services, e.g. 1M , 10M, 100M and 1G speed Ethernet)) for identifying one or more services with which that service contends for the bandwidth of the optical link.

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a bandwidth managing method, as taught by Bruckman et al., and identify a list of services, as taught by Branstad et al., in order to guarantee that the SONET network is utilizing its bandwidth efficiently.

Response to Amendment

Applicant's amendment filed on 1/20/2010, with respect to claims 1 and 16 on pages 2-8 of the remarks, have been fully considered.

In the present application, Applicants basically argue, that Sandstrom does not teach or suggest "computing metric of a usage of maximum allowed bandwidth, and the metric of current usage of the allowed bandwidth, such that the utilization metrics of the services are made approximately equal to each other". The Examiner has modified the response with a new reference which provides "computing metric of a usage of maximum allowed bandwidth, and the metric of current usage of the allowed bandwidth, such that the utilization metrics of the services are made approximately equal to each other". See the above rejections of claims 1 and 16 for the relevant interpretation and citations found in Furhmann, disclosing the missing limitations.

Conclusion

Any response to this Office Action should be **faxed to** (571) 273-8300 **or mailed to**:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Hand-delivered responses should be brought to

Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Sai-Ming Chan whose telephone number is (571) 270-1769. The Examiner can normally be reached on Monday-Thursday from 8:00 am to 5:00 pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Seema Rao can be reached on (571) 272-3174. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 571-272-4100.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

/Sai-Ming Chan/

Examiner, Art Unit 2462

April 6, 2010

/Kevin C. Harper/

Primary Examiner, Art Unit 2462